SUBPERIOSTEAL CALCIFICATION AND BONE-CHANGES IN EARLY SCURVY*

By CARL D. BENNINGHOVEN, M.D.
San Mateo

EARLY scurvy is sometimes confused with a suspected fracture by the clinician, but can be differentiated readily by x-ray films of the long bones. Most of the typical changes have been described in the monograph by Park, Guild, Jackson, and Bond.[1] These early classical roentgen signs are (1) a dense calcified lattice, (2) a zone of decalcification proximal to the lattice, (3) a cleft or crevice at the distal corners of the shaft, and (4) slight bagging at the distal margins of the shaft. These authors consider subperiosteal calcification a late roentgen sign of the disease. They also point out that these early roentgen signs are best demonstrated in postero-anterior studies of the wrists and knees, and lateral studies of the ankles. The distal ends of the ribs show the changes first; but these areas are difficult to x-ray satisfactorily.

The three cases presented show early clinical and roentgen signs of scurvy. The first case is atypical because of extensive subperiosteal calcification prior to the development of typical early roentgen signs in the diaphyses of the long bones. All three cases demonstrate the delay in the clinical relief of symptoms while under adequate antiscorbutic treatment, the delay of weeks before the bone changes due to scurvy are healed, and of several months before new bone has replaced the subperiosteal calcification.

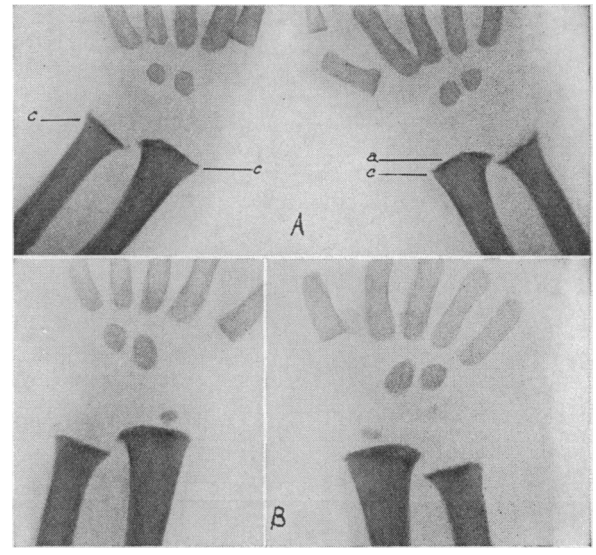

Fig. 2 (Case 2).—*A*, wrists; *a*, dense calcified lattice; *c*, clefts at distal ends of shafts. *B*, six months later, normal.

REPORT OF CASES

CASE 1.—W. C., a white, well-nourished male infant six months of age, who was referred on August 19, 1937, for examination of his left forearm for question of fracture. No fracture was seen in the x-ray films. The subperiosteal calcification and mottling in the cortex of the ulna suggested periostitis and osteomyelitis. The arm was put at rest, but the swelling and pain increased. On August 26, 1937, the subperiosteal calcification had increased and the temperature was 101 degrees rectally. The blood count was 24,850 white cells, with polymorphonuclear neutrophils 54 per cent, small lymphocytes 34, large lymphocytes 3, myelocytes 5, eosinophils 1, red blood cells 4,930,000, and hemoglobin 60 per cent. The ulna was needled, but only blood was withdrawn. This blood was negative for bacterial growth on culture media. On August 27, 1937, a purplish swelling developed under the left eye. A day later the right infra-orbital space was purplish. A blood culture was negative. At this time x-ray films of the left radius and left femur showed subperiosteal calcification and typical signs of scurvy at the ends of the diaphyses. A diagnosis of scurvy was made. The vitamin C of the blood as

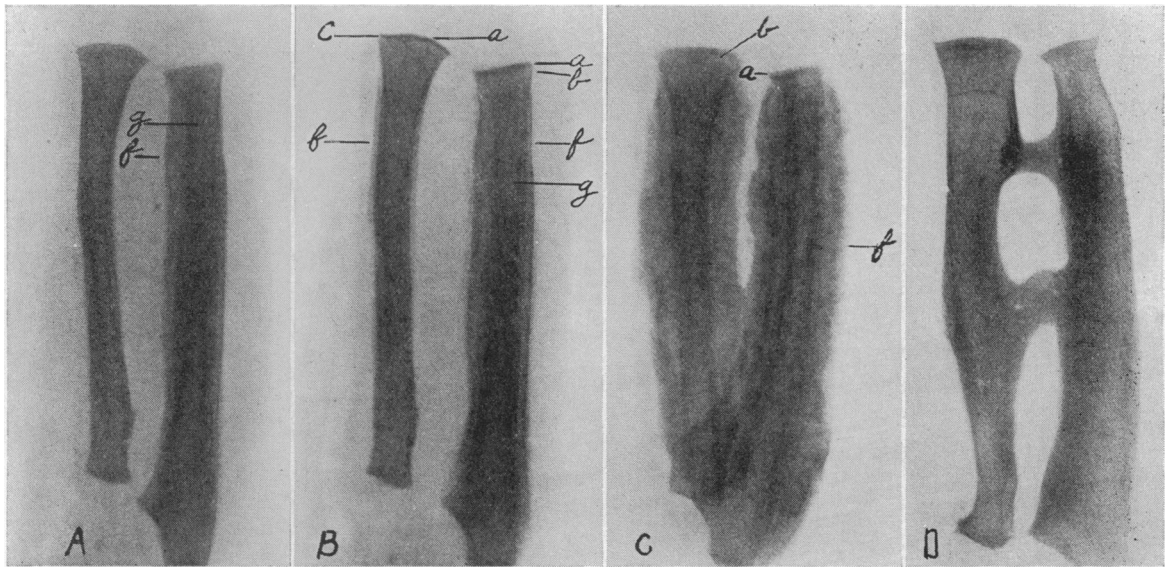

Fig. 1 (Case 1).—*A*, left forearm on August 19, 1937; *g*, cortex thin and granular; *f*, subperiosteal calcification. *B*, seven days later; *a*, dense calcified lattice; *b*, zone of decalcification; *c*, cleft at distal end of shaft; *g*, cortex thin and granular; *f*, subperiosteal calcification. *C*, twenty days later, subperiosteal calcification has increased, the zone of decalcification is less prominent and the calcified lattice is less dense. *D*, four months later, the cortex is thickened and a synostosis is present between the radius and ulna.

* Read before the Radiology Section of the California Medical Association at the sixty-seventh annual session, Pasadena, May 9–12, 1938.

1 Park, Guild, Jackson, and Bond: "The Recognition of Scurvy, with Especial Reference to the Early X-ray Changes," Archives of Diseases in Childhood, 9-10:265-294, 1934-1935.

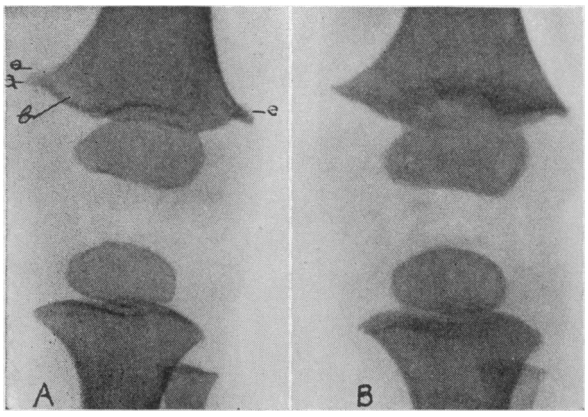

Fig. 3 (Case 3).—*A*, right knee; *a*, dense calcified lattice; *b*, zone of decalcification; *c*, bagging at margins. *B*, right knee normal four months later.

reported by Dr. James F. Rinehart was 0.24 milligram per cent. The leukocyte count remained between 24,000 and 36,000, and the temperature remained between 100 and 102 degrees rectally. Orange juice and 150 cubic centimeters of cevitamic acid were administered daily without improvement. The cevitamic acid in the diet was increased to 300 cubic centimeters daily. After sixteen days of vitamin C therapy the patient's symptoms improved. The x-ray films showed an increased amount of subperiosteal calcification. The calcified lattice was still present, and the decalcified area proximal to the calcified lattice was easily recognized. The cortex was thin and granular. As symptoms subsided, the appearance of the bone changed. The cleft or crevice was repaired. The calcified lattice became less prominent. The subperiosteal calcification decreased in amount and density. A line of increased density remained in the shaft indicating the period of arrested bone growth. The cortex remained thicker than normal.

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CASE 2.—N. L. A., a well-nourished Italian girl, eight months of age. The patient was referred because of pain in her left femur on motion. The parents stated the child had fallen from a bed a few days previously. X-ray films were interpreted as showing moderately early roentgen signs of scurvy. A calcified lattice was clearly defined. There was a decalcified area proximal to the lattice, and a cleft or crevice at the margin of the diaphysis. No subperiosteal calcification was present. Symptoms disappeared in seven days, with a diet of orange juice. X-ray films made four months later were interpreted as showing improvement, but not complete disappearance of the roentgen signs of scurvy. There was some question as to faithfulness in administering the orange juice. Six months later the bones were normal in appearance.

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CASE 3.—J. R., a well-nourished white female, one year of age. The patient was referred because of pain in her leg, which was thought to be due to a fracture. Interpretation of the x-ray films of her legs showed the typical calcified lattice at the ends of the shafts, the zone of rarefaction at the distal margins, and the slight bagging at the lateral distal margins. The clinical symptoms disappeared after a week's feeding on orange juice. Films taken three months later were interpreted as showing complete disappearance of the roentgen signs of scurvy.

CONCLUSIONS

1. X-ray is a positive early method of diagnosis in infantile scurvy, and a method of differentiating suspected fracture.

2. Subperiosteal calcification may precede typical scurvy changes in the diaphyses of the long bones.

3. Several days to weeks are required before symptoms of scurvy are controlled by adequate antiscorbutic diet.

4. Several months must elapse before the subperiosteal calcification is completely absorbed or formed into new bone.

Mills Memorial Hospital.

The author wishes to express his appreciation to Drs. Erma Macomber, Ernest W. Cleary, Milton Novotny, and F. Holmes Smith for the loan of the clinical data.

THE GRAD FROM TIMBUCTOO *

The medical texts are covered with dust,
Neglected and musty they stand;
And the compound 'scope is red with rust,
And the journals mold, near at hand!

Time was when the favorite texts were new
And the 'scope had its daily water;
'Twas then that the Grad from Timbuctoo
Left school—and put them there.

"You'll be right here when I've time," he said,
"And after my rounds are through!" . . .
Then he hurried off, at last, to bed
And dreamt that his plans came true.

But as he was dreaming, an urgent song
Woke the Grad from Timbuctoo . . .
The work came thick, and the money fast,
He had all that he wished to do.

And always waiting, right close at hand
While the dust and the rust grew more,
Were texts and journals and microscope
With the latest of medical lore.

Aye, faithful to Timbuctoo they stood
Each in its given place—
Just waiting the touch of a searching mind,
And the smile of a willing face.

They wondered as waiting the long years through
In the dust, without any care,
Why that Grad from Timbuctoo
Ever got them and put them there!

Then gradually, as the years slipped by,
The Grad felt his prestige fall,
And he realized with a sudden pang,
That he hadn't "kept up" at all;

He looked askance at the rust and dust
And the stack of journals high,
And he knew in his heart he'd never catch up
No matter how hard he'd try!

Are *you* like the Grad from Timbuctoo
Who failed in its standards high?
Will you, as the years go racing along,
Let the chance to "keep up" slip by?

If so, you'll wonder, while sitting alone
In the dear old office chair,
Why other doctors are busy as heck
And you are just sitting there!

Unsafe Rabies Vaccination Method.—The single injection method of vaccinating dogs against rabies is unreliable and should not be depended on, Benjamin F. Hart, M.D., and Elwyn Evans, M.D., Winter Park, Fla., report in *The Journal of the American Medical Association* for February 25.

They cite a patient of theirs, a white man, aged 41, who was bitten on the upper lip by a neighbor's dog while attempting to retrieve his own dog during a fight. Because both dogs had been vaccinated against rabies six months previously, by the single inoculation method, he did not consult a physician.

Twenty-two days later the symptoms of rabies appeared and twenty-four hours later a physician was called because of a "mild digestive upset with vomiting and a generalized headache." Since there is no known specific drug for clinically developed rabies, sulfanilamid was tried but it did not halt the progress of the disease. The man died.

* William J. Kerr, M.D., of San Francisco, in his postprandial talk on postgraduate training, at the one hundredth semi-annual meeting of the Southern California Medical Association, added to the entertainment of the dinner guests by giving these verses, penned by a member of his family, Dorothy Fisk Kerr.